

# THE SCIENCE NEWS-LETTER

*A Weekly Summary of Current Science*

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## BODILY BUILD A CLUE TO DISEASE

Diagnosis of disease from the physical build of the patient may become a reality if the conclusions reached by Drs. George Draper, Halbert L. Dunn, and David Seegal of the Presbyterian Hospital, New York, become generally confirmed. The "consumptive build" or the "bilious countenance" may be accepted as scientific realities.

Measurements made of 50 patients with gall-bladder disease, and of 39 patients with ulcers of the stomach or intestines have shown that those who suffer from one complaint have on the average a different physical build from those who suffer from the other. The diagnoses in all these cases were confirmed at operation. About 85 separate measurements were made on each individual.

Gall-bladder patients were generally heavier for their height than those afflicted with ulcer, had greater chest depth, a wider and squarer upper jaw, and showed other marked differences. The method offers confirmatory evidence in cases of doubtful diagnosis.

The physicians who made these investigations do not believe that a given physiological form "in itself predisposes to or actually causes disease", but merely that physical features express inherited influences and predispositions. Aside from their value in finding out what is the matter with sick people, these measurements, made upon well persons will be a guide to them as to what diseases they have particular reason to guard against.

These first reported scientific measurements were made at the new "Constitution Clinic" of the Presbyterian Hospital which has been established for the purpose of finding out the relations between the bodily structure, the body functions, the mental processes, and immunity and susceptibility to disease.

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The late Lord Salisbury, former prime minister of England, found his chief relaxation from cares of state in his scientific laboratory.  
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Two rubble and masonry dams built on the Loire river in Central France in 1711 are still protecting the valley of that stream from damaging floods.  
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## NEW DISCOVERY MAKES SEA NAVIGATION SAFER

Hitherto unsuspected facts about ocean currents, knowledge of which may prevent many shipwrecks along our coasts, have been brought to light in recent investigations by the U. S. Coast and Geodetic Survey, according to Lt. Commander G. T. Rude, Chief of the Division of Tides and Currents of that Bureau.

Contrary to the belief of mariners, a local wind creates a current setting not in its own direction, but in a direction about fifteen degrees to the right of the wind on the Pacific coast and about twenty degrees to the right on the Atlantic Coast, a long series of observations have shown.

"The importance of this", Commander Rude explained, "lies in the fact that a wind blowing parallel with the coast produces a current which may tend to set a coast-wise vessel onshore. For example, a vessel bound up the Pacific coast with a following 60-mile wind will overrun her log, due to wind-driven current alone, by one and two-tenths knots per hour and be set in toward the land fifteen degrees on the average to the right of the wind direction.

"While from Ekman's theory a deflection to the right in the northern hemisphere is to be expected from theoretical considerations, due to the earth's rotation on its axis, it is modified along the coasts by the configuration of the bottom, bottom friction, and the form of the coast line. Therefore, while a general law may be given of the general current produced by any given wind velocity, observations are necessary at intervals along the coast, particularly well inshore, to determine the actual velocities for that particular locality. On sailing lines for coastwise navigation, however, the general law will hold with sufficient accuracy for practical results within five to twenty miles offshore.

"It has been found", Commander Rude said, "that the velocity of the wind driven current varies fairly proportionately with the wind velocity and is about two per cent. in knots of the wind velocity in miles per hour on the Pacific coast and one and a half per cent. on the Atlantic coast.

"In practice, however, it is necessary to take into consideration the combination of this wind-driven current with the periodic tidal current, the direction of which changes constantly in a rotary movement. The velocities of this type of current vary with the changing phases of the moon on the Atlantic coast, while on the Pacific coast the principal variation in velocity is due to inequalities brought about by the declination of the moon."

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READING REFERENCE - Murray, John. The Ocean. New York, Henry Holt and Co., 1913.

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The heaviest snowfall in the United States occurs in the high Sierra Nevada of California and in the Cascade Range of Washington and Oregon where more than 65 feet of snow has fallen in a single winter.  
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## INVENTORS STILL HAVE CHANCE CHEMIST SAYS

Would-be inventors who think everything of value has already been invented might find solace in the consideration of a report on present research problems by Dr. J. E. Zanetti of the National Research Council, to be published in the next issue of the Journal of Industrial and Engineering Chemistry. The list of problems the solution of which would be eagerly welcomed by the scientific or technical world, numbers 100.

While many of these are not of apparent immediate practical application there are some which might bring wealth as well as fame to the inventor. Here are some of the more practical problems.

A study of the effect of a base metal upon the metal electroplated upon it; a general study of the use of barium cyanide in improving copper plating; a method for finding the degree of adherence of electroplated metal; a method for electroplating a steel spring without causing it to lose its springiness.

The whole study of corrosion is open to the inventors and investigators. Just what is the effect of impurities on the rate of corrosion of copper; and why does a small amount of "water-glass" prevent the corrosion of aluminum and other metals.

Liquid ammonia and liquid sulphur dioxide are coming into commercial use as solvents. Information is wanted on all phases of the problems connected with the use of these substances in this connection.

Much remains to be learned about rubber. The behavior of pigments in rubber, the plasticity of unvulcanized rubber, the solubility of rubber, what causes it to "age" after vulcanization; and many other questions of its chemical action and composition are awaiting the trained investigator.

Paints, cellulose, paper, are but some of the other common raw materials of industry about which much is to be learned. The inventor still has his chance.

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READING REFERENCE - Slosson, E. E. Creative Chemistry. New York, Century Co., 1920.  
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## FAKE PSYCHOLOGISTS FLAYED BY ALIENISTS

Charging that many lecturers and so-called schools are exploiting unscientific beliefs and practices under the guise of psychology, the National Committee for Mental Hygiene has issued a warning against fake psychologists.

"Much that is today called 'psychology' is misnamed", the Committee says. "Perhaps no word is more abused. It should not be confused with phrenology, spiritism, faith-healing, self-improvement by magic, psychic phenomena, and the like. Psychology is the science of human behavior.

"As often happens in the development of a new science, many people have seized upon the opportunity to gain support for their unscientific beliefs and

practices. The exploiters of the present interest in psychology may be roughly grouped as follows:

"First, there are certain lecturers who are going about the country organizing classes or advertising 'self-improvement' courses in the name of psychology.

"The second group consists of those correspondence courses that make extravagant claims for developing the mind and the will. These courses, whose charges, we understand, run from \$30 to over \$100. are alleged to be doing a land-office business.

"Then there are special book publishers, who write and issue sets of books, ranging in price from \$10 to \$30 a set, and some magazines purporting to discuss psychological subjects, which have a wide circulation.

"It is conceivable that some, at least, of the 'students' of such courses are inadequate personalities, who, from physical or other causes, are unable to compete successfully with their fellow-men, and see in these courses, lectures, and literature a cure-all for their troubles. In some instances no harm may result. But when a false sense of security postpones needed medical or psychiatric treatment, disaster is sure to follow. For these persons to resort to courses, lectures, and literature would seem about as effective as for them to carry a horse-chestnut, rabbit's foot, or other charm in their pockets."

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READING REFERENCE - Woodworth, Robert S. Psychology: a study of mental life. New York, Henry Holt and Co., 1921.

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#### POOR ROADS TAX FORD OWNERS 2.5 CENTS A MILE

Poor roads as compared with good ones impose a tax of 2.5 cents a mile upon owners of Ford cars who use them, according to cost figures prepared by J. T. Madison, assistant engineer of the Kentucky highway department. The figures were based upon the performances of 36 Ford cars operating over good roads, and 26 such cars operating over poor, unimproved roads.

The average cost per mile for the cars running on good roads was 4.22 cents; for those operating on the poor roads it was 6.72 cents. These figures included the cost of gasoline, oil and grease, tires, and repairs, but did not include storage or depreciation. The cost per mile for gasoline on poor roads was 2.3 cents, and on good roads 1.7 cents. Repairs cost 1.8 cents for every mile of good road travelled, while for every mile of poor road the repair bill amounted to 2.9 cents.

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Prehistoric Indian implements in a remarkable state of preservation were recently found in an old shell heap near the Washington State University.

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## EXPERIENCED AMOEBA SHUNS BRIGHT LIGHTS

Even the lowly amoeba, the jelly-like one-celled animal, learns by experience. S. O. Mast and L. C. Pusch of the Johns Hopkins University have observed these tiny animals under the microscope and find that they shun bright light. They learn by repeated trials how to avoid it efficiently.

An amoeba moves along by a combination of rolling and flowing. When it steps out, or rather flows out, it makes a projection which is called a "pseudopod". This projection is a sort of feeler.

"If the tip of a pseudopod of an amoeba going in a given direction comes in contact with a region of high illumination, it usually stops," the scientists report. "If it does, other pseudopods one after another usually are extended in the same general direction, each one stopping when it comes in contact with the highly illuminated region, until one is extended in a different direction. The number of pseudopods produced in an individual before the direction of extension is changed decreases with the experience of the individual.

"In one series of tests consisting of eighteen trials for each of two individuals, it decreased from an average of three and one-third for the first three trials to an average of one for the last three. In another series consisting of twenty-seven trials for each of five individuals it decreased from an average of one and one-fifth for the first three trials to an average of two-thirds for the last three."

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## SCIENTISTS DETECT ART FAKES AND FRAUDS

Art collectors can now add another weapon to their armory against the unscrupulous art faker and seller of false or retouched "old masters". Two French scientists have invented a method by which retouching may be detected through the use of different sorts of light thrown on the suspected painting. The use of these various colors throws the retouchings, scrapings, and false signatures into prominent relief.

If the picture be illuminated by ultra-violet light some pigments, such as zinc white, become fluorescent. A false Renoir was detected by a spectrographic analysis of a small quantity of pigment scraped from the picture. This was found to be cadmium yellow, while Renoir always used chrome yellow.

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## JAP CHILDREN SHOW HIGH INTELLIGENCE

Japanese immigrant children have as high intelligence as the average American school child, according to data made public by Prof. Robert H. Gault of Northwestern University after a series of tests of the Japanese children in the public schools of Denver. The Stanford-Binet test of mental alertness was used, but since the children were handicapped by language, the tests were modified to some extent.

The children showed a distribution of intelligence similar to what has been

found in native born white children. Eight per cent. of them had much more than average intelligence. Similar and earlier studies have indicated that oftentimes Japanese children as a whole are much superior in intelligence to white children living in the same social environment. These data presented by Professor Gault do not indicate much difference from the intelligence of white children.

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#### QUEER CLUB OF THIEVES LOCATED AMONG INDIANS

The Stone Hammer Society, an organization to teach Hidatsa Indian boys how to steal, is described by Miss Frances Densmore of the Smithsonian Institution's Bureau of American Ethnology in a recently published study of the music of these little known and almost extinct North Dakota Indians.

While the chief purpose of the society was to train boys in stealth and theft, there were strict regulations of the manner in which the stealing was done. The Stone Hammer raids took place at night, and it was required that before sunset the boys go through camp announcing that they would steal that night. Everyone was fully notified and proceeded to hide their provisions in what they considered the safest places.

It was not unusual, Miss Densmore reports, for the Stone Hammer boys to lift the blanket on which an old woman was sleeping, lay the blanket and the old woman gently to one side, and take the dried meat or other food from beneath her bed without waking her.

The next night the boys made up packs of gifts for the people who had been robbed, and it was considered that everything was properly adjusted.

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#### ALCOHOL DISPLACES GASOLINE IN PATRIOTIC SWEDEN

Competition between American gasoline and Swedish alcohol and the proposal to relax Sweden's liquor control in favor of the latter has become the subject of warm discussion by motorists in Stockholm. It was all started a short time ago when a Swedish-built motor car driven by Swedish sulphite alcohol won a thrilling victory over eleven foreign-built cars driven by gasoline. Later the same car took on 36 foreign competitors, and when the alcohol pushed it along into third place the driver and mechanic were given a patriotic ovation on the spot.

Now comes the question of how to be sober while boosting home industries. It is not hard for Sweden's thirsty citizens to find friends who know enough about chemistry to make a highly pleasing drink out of sulphite alcohol. Hence, the government authorities have kept the liquid under a ban against general use for industrial purposes. But love of country comes first, and if a Swedish car can beat even American cars - well, the Royal Swedish Board of Trade and the Swedish Liquor Control Board have both recommended the repeal of the restriction of sulphite alcohol. It is said that if the manufacturer pours a lot of methyl-ethyl-ketone, or something like that, into the alcohol, it is made unfit for human consumption. That may be the solution of the problem.

Sulphite alcohol is a by-product of chemical wood pulp, and the factories in Sweden have a capacity of about 3,000,000 gallons a year. Last year, however, only about 650,000 gallons were manufactured.

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#### INSANITY AND EFFICIENCY SHOW LIKE SEASONAL CHANGE

Insanity and physical efficiency increase and diminish according to the season and these changes are almost exactly parallel, says Dr. Frank P. Norbury in a report presented to the American Meteorological Society. Just those times of year in which most persons feel the fittest are the times when they are most apt to become subject to mental disorders, he declares.

The most favorable time for efficient work and for mental breakdowns has been shown to be the months of spring and early summer, Dr. Norbury states. From June there is a gradual decline until October when another and smaller increase begins, culminating in November, and then declining again to a minimum in February when the yearly rise begins again.

Climate is the underlying cause responsible for this similarity between the curves of insanity and of efficiency, the alienist continues. Insanity is, he says, very frequently the result of physical exhaustion, and stimulating weather not only promotes efficiency, but exhaustion and subsequent mental or nervous collapse in persons so predisposed.

"Man is more closely dependent upon nature than he has realized," he says, "and a knowledge of his natural limitations is the first step toward freedom."

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#### MIAMI VALLEY NOW SAFE FROM FLOODS

The people of Dayton, Hamilton, and other cities and towns of the Miami valley in Ohio are now secure against any repetition of the disastrous floods which caused the loss of 400 lives and the destruction of \$100,000,000 worth of property just 11 years ago this month. Chas. H. Paul, chief engineer of the Miami Conservancy District said in an address before the Franklin Institute recently.

This was effected through the building of dams along the upper reaches of the streams in the Miami watershed and through the deepening and widening of the lower channels. The actual work was begun in 1918 and involved the moving of about 19,000,000 cubic yards of earth and rock besides the relocation of 50 miles of railway. Concrete work amounted to 250,000 cubic yards. The work has been designed to protect against a flood 40 per cent. greater than the disastrous one of 1913, which itself was greater than any known since the settlement of the country.

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An automobile attachment by which the linear measurement of fields of various crops bordering on highways can be easily and quickly made has been devised by the U. S. Department of Agriculture.

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## ARSENIC USED TO POISON UNWELCOME TREES

Green trees can be "poisoned" and sprouting from stumps and roots prevented by the use of arsenic, according to investigations of the Michigan Agricultural Experiment Station.

Farmers have found that some trees, such as locusts, cottonwoods, and willows, will sprout vigorously even if cut in early summer, the best time of year to prevent regrowth. Two years of experiments by the Forestry Department resulted in the development of a tentative method of solving this difficulty.

Girdling a tree, while it killed it eventually, does not prevent the production of sprouts from below the girdled region. But the application of poisons to ax cuts in the base of the tree had been frequently recommended to the experimenters as a means of quickly killing trees. Accordingly they tried out different poisons on a number of kinds of trees, without the slightest effect being produced! Arsenic, phosphorus, sulphuric acid, carbolic acid, prussic acid, and other poisons could be put in gashes or holes in the trunks of young trees without injuring them.

But further experiments showed that a combination of the two methods gives the best results. Girdling clear around the tree, plus an application of arsenic poison, does the trick. The tree is first completely "frilled" or girdled. Arsenic is now poured into the frill, from an old teapot or sprinkling can, until the edge will hold no more. The solution to be used is made by boiling one pound of arsenic and one pound of washing soda in four gallons of water until the arsenic is all dissolved.

The experts warn that arsenic is even more poisonous to men and animals than it is to plants, and it should be used with extreme care. Cattle must be kept away from the base of the tree until any solution that may have been spilled has been thoroughly washed away by rain.

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CHILDREN DISOBEY TO GET EXCITEMENT

One reason why children disobey their parents is because they love the excitement disobedience causes, according to a bulletin on juvenile behavior just issued by the National Committee for Mental Hygiene. If making a child mind is made interesting by excitement, many children will want to be disobedient, just as some men fight for the love of it.

Parents are blamed for most of the disobedience of their children. Wrong methods are used to secure obedience, the report states. Commands are given when the children are inattentive, or there is too much indecision and insincerity, which the child quickly takes advantage of, or fear of punishment or hope of reward are too frequently employed.

Obedience to the right rather than mere submission to orders is held out as the ideal. While some parents obey their children and so give them the false idea that they are always going to get whatever they want, other children are taught submission so well that they are not allowed even to think for themselves, and so grow up into helpless men and women who always need someone to tell them



what to do. Securing the child's faith that what he is told to do is best for him is advocated as the first step, which should be followed by a method of training which will train them in knowledge of what is right, and in self-discipline.

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#### WHERE THE SHOE PINCHES

Many people claim their corns warn them of changes in the weather. But the corn is probably merely registering the changes in the area of the leather in the shoe. This varies with the amount of moisture in the air. A two per cent. change from normal either way is about all the average foot can stand without discomfort. Recently J. A. Wilson gave the New York section of the American Chemical Society the results of experiments which show that the amount of the pinching may depend on the kind of tanning used on the leather. He found that chrome leather absorbed more water from the air than did vegetable-tanned calf and was subject to much greater changes in area, with much more likelihood of pinching.

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#### WASHINGTON TIME SIGNALS HEARD NEAR AUSTRALIA

The British steamer "Port Kembla" has reported to the U. S. Hydrographic Office that the Washington radio time signals were heard on a recent voyage while approaching Australia from Cape Town. The position of the ship was given as approximately 46 degrees South Latitude, and 95 degrees East Longitude. Washington was then 10,570 miles distant from the ship, the direct line between the two crossing Africa at almost its widest part. Weather conditions at the ship were stormy, with rain and high winds.

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#### MALARIA SHAKES RUSSIA, CHILDREN CRY FOR QUININE

Estimates received by the Health Section of the League of Nations indicate that Russia needs over 660,000 pounds of quinine to fight malaria this year. Only 110,000 pounds will be available, and this acute shortage is hampering the systematic efforts of the Central Health Department to check the epidemic. In the district of Orechovo-Zujewo 80 per cent. of the children are said to be infected, in the governments of Voronege and Briansk, 30 per cent., and in the government of Rostov, 15 per cent. Nearly 350 out of every 10,000 people in Russia had malaria last year. In one district, the German Commune on the Volga, 44,600 out of every 100,000 of the population were infected.

Malaria is also rapidly spreading in Greece where it is estimated 40,000 pounds of quinine will be required before the end of Spring.

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Red Cross workers have transcribed the "Outline of Science" into the Braille system of raised letters to be read by the sensitive finger tips of blind people.

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TABLOID BOOK REVIEW

POPULAR SCIENCE TALKS. Published by the Philadelphia College of Pharmacy and Science. \$1.00.

A useful book for school or public library. Twelve lectures on matters of importance in everyday life such as glass, spices, aluminum, corn, iron, bacteria, explosives and medicines.

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FROGS ON ICE

A sidelight on the well-known effect of cold in slowing up the life processes of frogs has been thrown by their reaction to insulin, the extract of parts of the animal pancreas now used extensively in the treatment of diabetes. Too much insulin administered to warm-blooded animals causes fatal convulsions. The same thing happens to frogs when given an overdose, with the exception that, irrespective of the amount administered, the time required for the fatal symptoms to appear depends on how warm the frog is. While an overdose caused the appearance of symptoms in a few hours in the case of frogs kept at a temperature of about 85 degrees, the same or larger doses required five or six days to take effect if the animals were kept in an icebox.

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FRENCH USE MORE WATER

"More water each day keeps the doctor away," sings the Frenchman as he splashes about in the extra 100 liters of water that is now permitted him over and above his daily allowance in 1911. At least A. Dienert, who has charge of the water supply of Paris, says that in 1911 one hundred liters of water per person per day was commonly accepted as the minimum figure; whereas today it is set at two hundred and is constantly on the increase. He says that the war was responsible for many new sanitary measures that required more water, and the inhabitants never went back to their old ways. Figures relative to trade in soap between the United States and France do not throw any light upon the water, for France sells 25 per cent. more of her own soap, and buys 20 per cent. less of ours today than in 1911.

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A BIG BLAST

What is believed to have been the biggest blast ever set off in the history of industry was recently fired near Ogden, Utah, to provide material for constructing the fills that are the approaches to the Great Salt Lake trestle of the Southern Pacific Railroad. Earth and rock to an estimated volume of 550,000 cubic yards was raised and shattered by the explosion which used 301,200 pounds of special process powder, equivalent to 600,000 pounds of black powder. A hill 275 feet high and covering a face of approximately 1,000 feet in length was lifted up and separated into fragments. The placing of the explosives in tunnels, aggregating 4,100 feet in length, occupied 25 men for 45 days.

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